

AU/ACSC/190/1999-04

AIR COMMAND AND STAFF COLLEGE

AIR UNIVERSITY

**ENVIRONMENTAL LAWS AND ARMY TRAINING:  
A DICHOTOMY**

by

James S. Shutt, Major, US Army

A Research Report Submitted to the Faculty

In Partial Fulfillment of the Graduation Requirements

Advisor: LTC Jeffery Reilly, USA

Maxwell Air Force Base, Alabama

April 1999

## REPORT DOCUMENTATION PAGE

Form Approved OMB No.  
0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.

1. REPORT DATE (DD-MM-YYYY) 01-04-1999	2. REPORT TYPE Thesis	3. DATES COVERED (FROM - TO) xx-xx-1999 to xx-xx-1999		
4. TITLE AND SUBTITLE Environmental Laws and Army Training A dichotomy Unclassified		5a. CONTRACT NUMBER 5b. GRANT NUMBER 5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S) Shutt, James S. ;		5d. PROJECT NUMBER 5e. TASK NUMBER 5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME AND ADDRESS Air Command and Staff College Maxwell AFB, AL36112		8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME AND ADDRESS ,		10. SPONSOR/MONITOR'S ACRONYM(S) 11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT APUBLIC RELEASE ,				
13. SUPPLEMENTARY NOTES				
14. ABSTRACT I wrote this report to answer the question: What information does a new trainer need to know to train realistically in the Army today, given our environmental regulations? I obtained many primary sources in this document by personally visiting all of the installations I listed herein; Schofield Barracks, Hawaii, Fort Benning Georgia, and Fort Bragg North Carolina. In addition to visiting the installations, I have also been stationed at each of these posts, training at each of them for at least 2.5 years each. I served at Fort Bragg from 1983-1986, at Fort Benning from 1993-1995, and at Schofield Barracks from 1996-1998. I found about what I expected to find . that there was a wealth of information compartmentalized in the regulatory agencies and specialized arms of the garrison that deal with the regulatory agencies . but not in the trainer.s hands. The engineers are the proponents for environmental issues in the Army, so from the start environmental issues are not linked with training, but with garrison maintenance and infrastructure. Unfortunately, the trainer finds this out when he tries to plan and execute training, typically not before. That.s what this paper shows . the 7 main Federal Environmental Laws that affect training, the effects on training, how to mitigate those effects, what to read, and what the future holds in this area for the Army.				
15. SUBJECT TERMS				
16. SECURITY CLASSIFICATION OF:  a. REPORT Unclassified		17. LIMITATION OF ABSTRACT Public Release	18. NUMBER OF PAGES 40	19. NAME OF RESPONSIBLE PERSON Fenster, Lynn lfenster@dtic.mil
b. ABSTRACT Unclassified		19b. TELEPHONE NUMBER International Area Code Area Code Telephone Number 703767-9007 DSN 427-9007		
Standard Form 298 (Rev. 8-98) Prescribed by ANSI Std Z39.18				

## **Disclaimer**

The views expressed in this academic research paper are those of the author(s) and do not reflect the official policy or position of the US government or the Department of Defense. In accordance with Air Force Instruction 51-303, it is not copyrighted, but is the property of the United States government.

## ***Contents***

	<i>Page</i>
DISCLAIMER .....	ii
ILLUSTRATIONS .....	v
PREFACE .....	vi
ABSTRACT.....	vii
INTRODUCTION .....	1
CURRENT FEDERAL ENVIRONMENTAL REGULATIONS .....	3
The Clean Air Act.....	3
The Clean Water Act .....	4
CERCLA and SARA .....	4
The Endangered Species Act.....	4
The National Environmental Policy Act.....	5
Resource Conservation and Recovery Act (RCRA).....	5
Safe Drinking Water Act .....	6
EFFECTS OF ENVIRONMENTAL REGULATION IN A TYPICAL ARMY	
DIVISION OR TRAINING BASE.....	7
Running Scared; Army Hedges Training Realism to Satisfy Environmental Law.....	8
The Effects of the Endangered Species Act: The Training Killer .....	9
The Red Cockaded Woodpecker (RCW) and Gopher Tortoise: Scourge of the Southeast .....	9
Other Endangered Species that Limit Maneuver and Live Fire Training .....	11
Effects from Archaeological Sites .....	12
CURRENT ENVIRONMENTAL – SPECIFIC INFRASTRUCTURE ON ARMY	
POSTS .....	15
Fort Bragg, North Carolina; Airborne and Rapid Deployment Force's Home:.....	16
Fort Benning Georgia, Home of the Infantry: .....	17
Schofield Barracks, Hawaii – Tropic Lightning! .....	18
Navigation Aids through Murky Waters .....	19
TRAINER ACTIONS TO TAKE.....	21

Educate .....	21
Educate Yourself .....	21
Visit the Master Planner, ENRD section, and Range Officer in Person.....	22
School the Soldiers – Formally and Informally.....	22
Plan for Changes to the Training Plan.....	23
Modularize your training .....	23
Get Involved with the Master Planner and Advocate Rotating Training Areas .....	23
Courses to take, Army and Local .....	23
Mitigating by Planning Ahead: Fixing Training Time Deficiencies Caused by Environmental Regulation .....	24
 FUTURE IMPACTS OF ENVIRONMENTALISM ON ARMY TRAINING.....	26
Relief from the Endangered Species Act will not come for Government .....	27
Increased Competition for Training Land .....	28
Working within the Law – Incidental Take and Smart Planning by Thinking Ahead .....	28
 CONCLUSIONS.....	31
 BIBLIOGRAPHY .....	32

## ***Illustrations***

	<i>Page</i>
Figure 1. Environmental Division, Fort Bragg .....	17
Figure 2. Environmental Division, Fort Benning .....	18
Figure 3. Environmental Division, Schofield Barracks, Hawaii .....	19

## *Preface*

I first began thinking about this topic in earnest when I was assigned as the battalion Operations Officer of the 2d Battalion, 27<sup>th</sup> Infantry in Schofield Barracks, Hawaii. Although I had been in the Army for 13 years at that point, I had always been able to accomplish the kind of rigorous training that predicated great units. I found that it was very hard to do that in Hawaii due to environmental and cultural impacts. Later, as the Chief of Training for the 25<sup>th</sup> Infantry Division, I served on several committees and tried to make some inroads toward realistic training to standard while satisfying the environmental requirements. I found if one knew the regulations, agencies, and planned in advance for difficulty, it could be done. One of the biggest problems though, is that these problems are not recognized. Operations officers typically change yearly, their commanders every two years, and the continuity is simply not there. Someone needs to lay out the problems and solutions – that is the genesis, scope, and aim of this paper.

I wish to acknowledge and thank Paul Eaves and Vic Garo from Range Division Hawaii, as well as the members of the Makua Planning committee. From Fort Benning, John Brent and Emil Matula from the Environmental Management Division contributed immensely. At Fort Bragg, Daniel W. Frisk, Wildlife Biologist, spent about 4 hours talking to me on a cold holiday during Christmas 1998. Lastly, LTC Jeffery Reilly as my Faculty Research advisor also contributed greatly. I hope that this helps some new trainer navigate these vast environmental minefields.

### ***Abstract***

I wrote this report to answer the question: What information does a new trainer need to know to train realistically in the Army today, given our environmental regulations? I obtained many primary sources in this document by personally visiting all of the installations I listed herein; Schofield Barracks, Hawaii, Fort Benning Georgia, and Fort Bragg North Carolina. In addition to visiting the installations, I have also been stationed at each of these posts, training at each of them for at least 2.5 years each. I served at Fort Bragg from 1983-1986, at Fort Benning from 1993-1995, and at Schofield Barracks from 1996-1998.

I found about what I expected to find – that there was a wealth of information compartmentalized in the regulatory agencies and specialized arms of the garrison that deal with the regulatory agencies – but not in the trainer's hands. The engineers are the proponents for environmental issues in the Army, so from the start environmental issues are not linked with training, but with garrison maintenance and infrastructure. Unfortunately, the trainer finds this out when he tries to plan and execute training, typically not before. That's what this paper shows – the 7 main Federal Environmental Laws that affect training, the effects on training, how to mitigate those effects, what to read, and what the future holds in this area for the Army.

## Chapter 1

### Introduction

*Then GOD said: “Let us make man in our image, in our likeness, and let them rule over the fish of the sea and the birds of the air, over the livestock, over all of the earth, and over all the creatures that move along the ground”.*

-The Bible, Genesis 1: 26

Man in fact rules the earth, and does so with an ever-expanding glossary of regulations. The Federal Government makes these laws, and the Army, as a government agency, is bound by law to follow them. These pervasive laws have come to affect every facet of the Army, including training for combat, the most important thing we do in peacetime. The competency of the Army, and our ability to win the nation's wars depends on realistic training to standard. FM 100-5, our capstone manual, calls it every leader's most “solemn responsibility.”<sup>1</sup> Yet in all installations there are detrimental limits put on training by the enforcement of environmental law.

I first became aware of this problem when I entered the Army in 1983, but the regulations weren't stifling then. One could still train by the manual, and train to standard. There were some excellent examples of good, realistic training in 1983 at Fort Bragg, North Carolina. Unfortunately, the times have changed.

In order to train well now, the trainer must be armed with knowledge of the laws, knowledge of the installation, and know where to find answers. This paper will answer those questions.

### **Notes**

<sup>1</sup> Department of the Army, *FM 100-5, Operations* (Headquarters, Department of the Army, Washington, DC, 14 June 1993), 1-5.

## **Chapter 2**

### **Current Federal Environmental Regulations**

There are seven major federal environmental laws that affect training in the Army, and all other legislation is built around these. We will look at these laws and their effects on training today.

#### **The Clean Air Act**

The Clean Air Act sets our nation's ambient air quality standards. The purpose of this act, first known as the Air Pollution Control Act of 1955, was to legislate that each state set its own air standards. That approach did not work, so in 1963 and again in 1970, the Department of Health, Education and Welfare (HEW) and the Environmental Protection Agency (EPA) took charge of the regulation and established national air quality standards.<sup>1</sup> The act requires that the EPA set two types of standards for ambient air quality – primary standards, designed to protect human health (with an ample margin of safety), and secondary standards, designed to protect public welfare. The standards are to be reviewed and modified as necessary every 4 years.<sup>2</sup> Later amendments in 1990 established emission limits for both existing and new pollution sources, set emission standards for hazardous air pollutants and mandated the production stoppage of certain ozone-depleting substances.<sup>3</sup>

## **The Clean Water Act**

The Clean water act is designed to restore and maintain the quality of our nation's waters. It regulates the discharge of pollutants into our waters from any point source including stormwater drainage systems, industrial facilities, as well as nonpoint runoff (runoff from farmland, etc.). The Act also contains provisions that require the reporting and cleanup of oil and hazardous substance spills in or with the potential to reach waterways. This is the portion of the Clean Water Act that is most troublesome to the Army. The act also regulates wetland use.<sup>4</sup>

## **CERCLA and SARA**

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act (SARA) establish a series of programs for the cleanup of hazardous waste disposal and spill sites nationwide. CERCLA also establishes cleanup programs for old sites. These regulations have little impact on the conduct of training, but many on the use of training lands.<sup>5</sup>

## **The Endangered Species Act**

This is the killer. The Endangered Species Act (ESA) protects both plants and animals that are listed by the national Marine Fisheries Service and the US Fish and Wildlife Service as endangered or threatened. Endangered species are those that are in danger of becoming extinct; threatened species are those that are likely to become endangered.

The ESA conserves ecosystems upon which endangered and threatened species depend by prohibiting any Army or Federal action that may jeopardize the continued

existence of that species in its natural habitat. It provides for the designation and protection of the area as critical habitat. A substantial portion of the training problems illustrated in this paper are directly caused by or affiliated with this act.<sup>6</sup>

### **The National Environmental Policy Act**

This act involves the public in decision making. It is a procedural law that requires all federal agencies to consider the environmental effects of any major action (like training) that they sponsor. It can affect potentially every action proposed on a facility, installation, or training area. The effects of an action are drafted on an environmental assessment (EA) or environmental impact statement (EIS). If an EA is required and the outcome dictates that no significant environmental effect is anticipated, a finding of No Significant Impact is issued by the EPA. This act is responsible for most of the administration and paperwork inherent in training on Federal land now, and also affects every facet of building, improving, moving or training on structures or land on US soil.<sup>7</sup>

### **Resource Conservation and Recovery Act (RCRA)**

The Resource Conservation and Recovery Act regulates the transportation, handling, storage, treatment, and disposal of solid and hazardous waste. The goal of course, is to keep hazardous waste contained and out of our environment. It places cradle to grave responsibility for hazardous waste on those people or units generating the waste and requires them to meet various standards in training, facility inspections, waste identification and analysis, emergency response planning, and record – keeping. RCRA also has provision for all underground storage tanks.<sup>8</sup>

## Safe Drinking Water Act

The Safe Drinking Water Act regulates our drinking water by setting primary and secondary standards of quality. Its goal is to ensure that the drinking water supplied to the public is safe. It also covers the criteria for the operation of water supply systems to ensure safe compliance<sup>9</sup>.

These are the federal environmental laws that limit Army training; we will discuss how that training is limited in the next chapter.

### Notes

<sup>1</sup> Vicki R. Patton-Hulce, *Environment and the Law A Dictionary*, (Santa Barbara, Calif, ABC-CLIO, Inc.), 67.

<sup>2</sup> Ibid., 67.

<sup>3</sup> Ibid., 67.

<sup>4</sup> Office of Environmental Policy and Assistance, *Federal Environmental Laws*, (Internet source, <http://ltis-ut.en.doe.gov/oepa/laws.html>, posted 25 Jan 1996, Clean Water Act link.

<sup>5</sup> Ibid.,CERCLA and SARA link.

<sup>6</sup> Patton-Hulce, *Environment and the Law,A Dictionary*, 125.

<sup>7</sup> Headquarters, Department of the Army, *Training Circular (TC) 5-400, Unit Leader's Handbook for Environmental Stewardship*, (Headquarters Washington DC, 3 October 1995), A-5.

<sup>8</sup> Ibid., A-9.

<sup>9</sup> Ibid., A-9.

## Chapter 3

### Effects of Environmental Regulation in a Typical Army Division or Training Base

*On the day of battle, soldiers and units will fight as well or as poorly as they are trained. Training to high standards is essential in both peace and war; never can Army forces afford not to train and maintain the highest levels of readiness.*

FM 100-5, Operations, 1993 page 1-5

Of the 32 percent of land in the US owned by the Federal Government, only 4% are dedicated to military training.<sup>1</sup> Training is tantamount to success in any Army operation, and that success is being placed in jeopardy each year by the burgeoning effects of environmental regulation. Whether or not the laws are correct is not within the scope of this paper; it is the opinion of the author that all laws that are rightfully voted on and passed are correct. However, there are some dynamics that are prevalent in the military training process which are not apparent to the taxpaying citizen, and even some trainers, and these things ultimately affect readiness. Most of these dynamics can be placed into three categories: Time spent on satisfying the environmental bureaucracy; opportunity taken away by environmental regulation (either land, land use, or time related); and money spent which would prohibit training. An illustration of this is Range 23 in Hawaii's Pohokaloa Training Area (PTA). This facility was built in the late 80s at a cost of over 30 million dollars, yet has never been used. The reason is because of the timing

of its building, and the lack of will of the command to push the state of Hawaii for an environmental assessment concerning the range's effect on the larger area. Since PTA has several endangered and threatened plants on the installation, the leadership is convinced that the money and time spent in legal battles will not be worth the sunk cost of the range, and the resultant public opinion of the few vocal people that are opposed to its opening. Of course, another key factor is that it's essentially a tank or LAV range and there aren't any Army tanks or LAV's in the area – the 25 ID changed their organization in the late 80s and obviated the need for the range. But the real issue here is that a few plants are standing in the way of a 30 million-dollar (poorly planned) facility being used.<sup>2</sup>

### **Running Scared; Army Hedges Training Realism to Satisfy Environmental Law**

Beginning in 1990 the Federal Government passed more environmental legislation and began allowing state agencies to regulate and inspect for both Federal and State environmental regulations.<sup>3</sup> The Army leadership was surprised when the states began enforcing these regulations, especially when a few military people were threatened with fines! For the first time, there were General Officers being threatened with fines in conjunction with environmental legislation. In 1990, MG Jerry White, then commander of the 7<sup>th</sup> Infantry Division in Fort Ord, was threatened with fines for environmental violations to the state of California. These levies were the first time any military official had been threatened with reparations. According to his aide at the time, Captain John Carothers (now a Major stationed at Fort Leavenworth) these threats had a tremendous impact on training philosophy and procedural matters in the 7<sup>th</sup> Infantry Division.<sup>4</sup> The Army subsequently began hiring more people trained in environmental areas, and

revising the current sets of policies and regulations. The overall effect has been tough on training.

### **The Effects of the Endangered Species Act: The Training Killer**

As shown earlier, the Endangered Species Act lists genus and phylum of plants and animals, as they grow smaller in numbers. As the species becomes smaller in number, it reaches first the threatened status, then endangered status. Once this happens (which is only precipitated through manual counting and mortality studies by wildlife biologists and botanists) the area which surrounds the species is then called “critical habitat” and is only allowed to be used for certain types of activities.<sup>5</sup>

This simplified explanation is the scenario that has taken place on all Army training land in the past 25 years since the inception of the Act in 1973; but the worst restriction has taken place in the past 8-10 years. In any Army installation you visit now, the trainer now may be more concerned with the environmental rules that he breaks than the training he conducts. Here are some specific examples that illustrate the point.

### **The Red Cockaded Woodpecker (RCW) and Gopher Tortoise: Scourge of the Southeast**

The Red Cockaded Woodpecker has been protected in various forms since 1970 and we in the Army came to know of its inclusion shortly after that. The bird lives in old or dying pine trees, usually 70 or 80 years old. In the southeastern United States, that tree is the prevalent type on military installations.<sup>6</sup>

In the civilian sector, people clear land to build houses, and if they have pine trees that are greater than 13” in circumference, they generally log off the trees and sell them for timber. Since the pine tree can grow about an inch per year in circumference in

almost any soil, the patron has a new tree ready in another 13 years, and red cockaded woodpeckers are not a problem, for the trees never get old enough to support the species.

On a military installation though, one needs the trees for cover, and on most posts there are significant trees in excess of 80' in height and over 48" in circumference. The Red Cockaded Woodpeckers were there in the trees in 1985, and the biologists started counting them.<sup>7</sup> This happened in Fort Bragg, Fort Stewart, Fort Benning, and the Florida Ranger Camp at Eglin Air Force Base, where this author was stationed at the time.<sup>8</sup>

The Department of Fish and Wildlife (DFW) came out and counted, and shortly began marking colonies of these birds. Unfortunately, there was a paradox occurring. The birds liked older, dying trees. We put live fire ranges in place, and the resultant machinegun bullets that hit the trees slowly start killing them, then the birds moved in. In our case, we would construct a new range, in about 6 weeks the birds would move in, and then we would have to move the range to another location to get away from the birds.<sup>9</sup>

Once all the biologists had counted the birds, it seemed all Federal Installations in the Southeast had an infestation on their hands of the “endangered” Red Cockaded Woodpecker (RCW). It seemed that the birds knew a good thing – just go on the Federal lands and they would be protected. There would be no danger of the Federal Government lifting the status on the birds, because of the civilian private land ownership problem. With the federal laws, federal lands, and Army training enabling it, the RCW had and still enjoys a lush habitat on all Army Installations in the Southeast. For example, one has only to look at a Range Control Overprint 1:50000-map sheet to see the 426 colonies present in Fort Bragg’s training area today.<sup>10</sup>

In 1994 at Fort Benning the DFW rendered the opinion that the installation was in jeopardy of endangering the woodpecker, so at present the installation must prove essentially that it is harboring these birds until their numbers propagate and elevate above endangered status. At that time the post can apply for greater training latitude.<sup>11</sup>

At Fort Bragg, the post is in better shape because the cluster numbers have risen, although soldiers cannot drive vehicles within 50 feet of the marked trees, cannot dig fighting positions, cannot use training pyrotechnics, or smoke.<sup>12</sup>

To a greater extent the same thing has happened with the gopher tortoise. Range Control at Forts Bragg and Benning have an overprinted map with areas of gopher tortoise colonies, and their areas are sometimes marked on the ground with various wire cages and nesting area signs. Soldiers are threatened with fines for disturbing nests or damaging turtles, and are prohibited from walking, driving, or maneuvering at all around any of these animals or their habitat.<sup>13</sup>

### **Other Endangered Species that Limit Maneuver and Live Fire Training**

The scenario that we just read about in the Southeast is replicated in many areas throughout the Department of Defense (DOD). DOD installations have in some places become nature conservation areas, instead of places to train to win the nations wars. There simply is no *legislated* balance, so it is up to the commander of each installation (usually a 2 star General officer) to figure out the balance himself, notwithstanding the ever present legal threats from the environmental regulations. In Fort Irwin, California, an area virtually devoid of significant wildlife, they still have the desert tortoise and the brine shrimp to protect. In our northwestern installations like Fort Lewis, they have the spotted owl. In Hawaii, a huge list including the Oahu tree snail and various plants

comprise the protected species. The area is particularly sensitive environmentally because 2/3 of the species extinctions that have occurred in the US have occurred in Hawaii.<sup>14</sup> As an example, last year in Hawaii, the Range Division spent several hundred thousand dollars fencing around the entire Makua Valley to keep feral (wild) swine, goats, and other ungulates (animals) from eating the protected plants. Most of these wild animals are not indigenous to the islands, but one cannot trap or kill them, hence the fences.<sup>15</sup>

### **Effects from Archaeological Sites**

Since military land is undeveloped, the development that has characterized the civilian sector and limited archaeological finds has now become another factor that has limited military training. Archaeologists flock to federal lands to explore, and they find many things. On any DOD installation map now, there for all to see on the overprinting, is the latest discovery of archaeological sites. In most cases the discovery has been facilitated by the openness and attempts to cooperate with civilian ecological concerns. On Schofield Barracks, in the Wainae community, in the Makua valley live fire site, there are over 30 archaeological sites, including a heiau.<sup>16</sup> A heiau is an ancient Hawaiian religious site of particular cultural significance.

This particular valley, called Makua, is of importance to Hawaiians and military personnel alike. For over 50 years it has been used as a training site for live fire and amphibious training. It provided door gunner (aerial live fire training) to a generation of combat soldiers before Vietnam. It has continued to provide Army, Marines, Naval and other DOD agencies the only live fire facility of its kind on the island of Oahu. Yet, with the discovery of these ancient sites, the plethora of endangered plants, and the

endangered species, Makua has become a very difficult place to train; one more akin to a nature preserve than a training area.<sup>17</sup>

To summarize then, the crux of the matter is this: Training in the Army has to be a tailororable activity, geared to the enemy we will fight. It has to be tough and realistic, replete with the sights and sounds of the battlefield. Realistic training of this sort involves at least temporary destruction of habitat, yet our leadership is hesitant to allow that. So what we get, especially for the unprepared trainer, is watered down training in pre-designated lanes to satisfy environmental concerns. Limiting the use of smoke, tracer ammunition, digging by soldiers, explosives, and curtailments of all types have neutered our training. This has had a negative impact on the force, because our training does not meet the standard specified in the mission training plan documents the Army produces, and our ranges do not meet the goal as specified in Training Circular (TC) 25-8, *Training Ranges*. Yet there are ways to fix this problem, through knowledge, coordination, and forethought. The organization that is charged to make this whole balance problem easier for the trainer is the Environmental Management Branch found on every post.<sup>18</sup>

During the eighties, when commanders could see the increase in legislation coming, most implemented the functions of environmentalism into the (usually) Directorate of Public Works branch of the garrison side of installations. Today, ten years later, many environmental sections on various posts have grown very large. We will examine the infrastructure and makeup of the environmental divisions on three different posts next.

### Notes

<sup>1</sup> Council on Environmental Quality, Executive Office of the President, *Environmental Trends*, (US Government Printing Office, Washington,DC, 1989), 74.

<sup>2</sup> Record of Conversation, Paul Eaves and Vic Garo, Chief and Ops Officer of Range Division Hawaii, 20 Apr 1998.

## Notes

<sup>3</sup> Record of Conversation, Emil Matula, Fort Benning Georgia Environmental Management Division, 7 Dec 1998.

<sup>4</sup> Record of conversation between author and MAJ John Carothers, 1994, Fort Benning Georgia.

<sup>5</sup> Paul R. Portney, *Current Issues in Natural Resource Policy*, (Baltimore Md: Johns Hopkins University Press, 1982), 130.

<sup>6</sup> Endangered Species Branch, *The Red Cockaded Woodpecker at Fort Bragg, North Carolina* (training pamphlet, Department of the Army, XVIII Abn Corps and Fort Bragg, Fort Bragg, North Carolina, 1998) 1-8.

<sup>7</sup> Record of Conversation, personal interview with Dan Frisch, wildlife biologist, Fort Bragg North Carolina, 31Dec 98.

<sup>8</sup> Author's journal notes, November 1988 – December 1989. During this time period we constructed 2 live fire ambush ranges on Field 6, Eglin AFB. We had to move each of them 3 times after woodpeckers would come in and infest the trees after we had been using the ranges for about 6 weeks.

<sup>9</sup> Ibid.

<sup>10</sup> Record of Conversation, Frisch, 31 Dec 98.

<sup>11</sup> Record of Conversation, Matula, 7 Dec 98.

<sup>12</sup> Endangered Species Branch, *Soldier Field Card, Fort Bragg North Carolina* (training card, Department of the Army, XVIII Abn Corps and Fort Bragg, Fort Bragg, North Carolina, 1999).

<sup>13</sup> Ibid.

<sup>14</sup> Portney, *Current Issues in Natural Resource Policy*, 124.

<sup>15</sup> Record of Conversation with Paul Eaves, Chief RDH, 8 May 1998.

<sup>16</sup> Record of Conversation, Makua Planning Committee, 18 May 1998.

<sup>17</sup> Ibid.

<sup>18</sup> Headquarters, Department of the Army, *Training Circular (TC) 5-400, Unit Leader's Handbook for Environmental Stewardship*, (Headquarters Washington DC, 3 October 1995), 6-1.

## Chapter 4

### Current Environmental – Specific Infrastructure on Army Posts

*If you don't know where you're going, any path will get you there*

-COL Chuck Cardinal, speaking on goal setting, 1997

Every newcomer to the training scene these days will need to know not only the usual training infrastructure, but also the environmental infrastructure. The difficulty lies in the fact that each post organizes their environmental organization differently. In this chapter, we will examine several organizational structures.

Fort Irwin, in 1990 for instance, had many civilian maintenance contractors to fix vehicles, a few movement personnel, a small operations group contingent, and the Table of Organization and Equipment (TOE) unit there, the Opposing Forces (OPFOR) Regiment. There were about 200 others on the entire post to run it, and no one on the staff dedicated to environmental issues.<sup>1</sup> Most things environmental were handled through range control and Operations group, and individual incident cleanups were handled by the player unit or contracted out.<sup>2</sup> Environmental organizations have grown throughout the Army since then, and some are more trainers – friendly and efficient than others.

In the author's opinion, of the three structures listed in this paper, Fort Bragg's is the best, for it is a flat organization, containing few management layers. This organization

also task organizes as needed to combat specific threats by hiring experts, or forming high performance teams to work out specific problems. Trainers can easily find the subject matter expert, and do not have to talk to managers or gatekeepers. This is the organization for the rest of the Army to emulate. TC 5-400, however, advocates an example organization that has three management layers between the trainer and the subject matter expert. Both Fort Benning and Schofield Barracks follow this model, shown later in this chapter. As a trainer though, you have to know how to navigate through them all.<sup>3</sup>

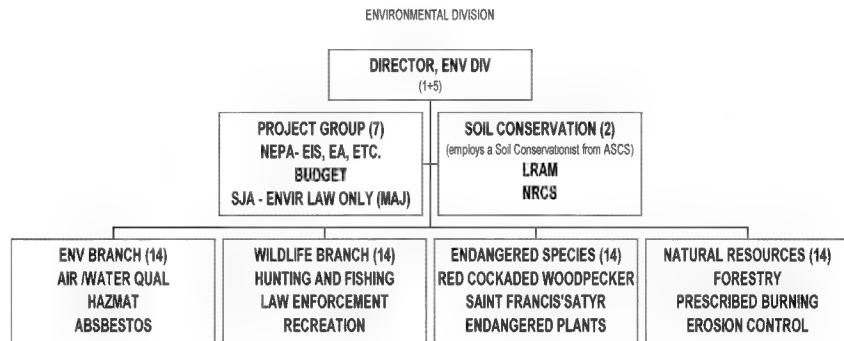
#### **Fort Bragg, North Carolina; Airborne and Rapid Deployment Force's Home:**

Fort Bragg, a strategic post for the Army, came into being in 1903 as an artillery range and later was the home of the eighty second division, later the eighty second airborne division after World War II. Since that time it has become arguably the premier installation in the Army, year after year, because of the mission and magnitude of its training.<sup>4</sup>

Because of the vastness of its training area (over 200 square miles)<sup>5</sup>, the thriving population of Red Cockaded Woodpeckers and other endangered plants and animals, Fort Bragg employs a large environmental - specific infrastructure. The offices of the various agencies are all organized under the Public Works Business Center, the organization formerly known as Department of Public Works (DPW).<sup>6</sup>

The Public Works Business Center's Environmental and Natural Resources Division (ENRD) has 71 people working in the organization, with more hired on as needed. For example, the division recently hired a soil conservationist from the Natural Resources Conservation Service (formerly the Agricultural Soil Conservation Service) to combat

Fort Bragg's soil erosion problem, since Bragg is located in the sandhill region of North Carolina.<sup>7</sup> The Environmental and Natural Resources Division is robust, reflecting the large area and scope of Fort Bragg's operational and training mission. The subunits are organized along functional lines, so the trainer is able to go directly to the proponent.<sup>8</sup> See figure 1 for detail of the division.

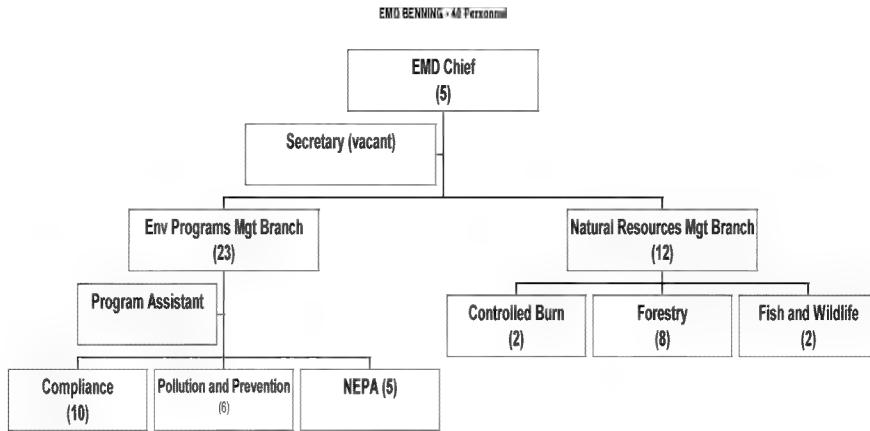


**Figure 1. Environmental Division, Fort Bragg**

### **Fort Benning Georgia, Home of the Infantry:**

Fort Benning Georgia is a smaller post, and its operational pace is slower than at Fort Bragg.<sup>9</sup> There are many people training at Fort Benning, but not in the large concentrations found at Fort Bragg. Fort Bragg has over 20-drop zones, airplanes are flying all the time, vehicles are constantly in and out of motor pools, and the training areas are always busy. At Fort Benning, the activity level is lower, and much of the activity has been institutionalized and relegated to the same areas time after time – “routineized,” if you will.<sup>10</sup>

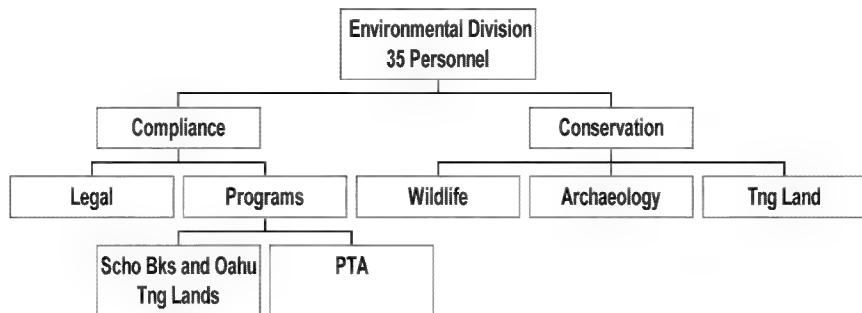
As you can see from figure 2 below, the division is smaller than the element at Fort Bragg. Yet, if you look closely at the charts, there are more layers of management than the division at Fort Bragg.



**Figure 2. Environmental Division, Fort Benning**

### Schofield Barracks, Hawaii – Tropic Lightning!

As we have seen from the previous two examples, there is no set structure for an Environmental Division at a post. Fort Bragg had many people and a dynamic division, and Fort Benning had a smaller but more managed structure. At Schofield Barracks (fig 3) the post has 35 people dedicated to Environmental Management, and the post's garrison activity task organizes others to help out as the situation warrants. Part of the reason for this is the close proximity of other Army installations on the island, and their ability to give Schofield Barracks top cover on issues. Schofield Barracks has their Environmental section directly under the DPW, and it consists of the Conservation Branch (protection of natural resources and archaeological sites) and Compliance Branch (Law compliance). As you can see, this organization has been formed by function rather than to combat specific laws, as in the Benning and Bragg examples earlier.<sup>11</sup>



**Figure 3. Environmental Division, Schofield Barracks, Hawaii**

### **Navigation Aids through Murky Waters**

All of these organizations exist to help the trainer accomplish his mission and to bring the Army into compliance with existing laws. Yet, many trainers never have any interface with these organizations. The author used to teach a one day seminar with each group of new trainers in 1997 and 1998 and less than ten of the 125 enrollees knew of the Environmental Division or where it was located on the installation.<sup>12</sup>

This is significant because the environmental branch on each post has to approve any significant training activity. Most posts use a specific form or require a memo before any excavation (to include digging fighting positions) can occur, or any trees removed, etc.<sup>13</sup> The smart trainer cultivates the knowledge and ability in these organizations, and prepares his training plan in advance. He can also do other things to help his cause, which we will examine in the next chapter.

### **Notes**

<sup>1</sup> Author Notes, OC record book, TAF guide, Operations Group, Fort Irwin California, January 1990, 34.

<sup>2</sup> Ibid.,2.

<sup>3</sup> Headquarters, Department of the Army, *Training Circular (TC) 5-400, Unit Leader's Handbook for Environmental Stewardship*, (Headquarters Washington DC, 3 October 1995), 6-1.

## Notes

<sup>4</sup> Department of the Army, Headquarters 82d Airborne Division, Fort Bragg, North Carolina, *82d Airborne Division Regulation 350-1, Training*, (Headquarters 82d Abn Div G3 Training, November 1995), 1-1.

<sup>5</sup> U.S. Army Corps of Engineers, Construction Engineering Research laboratories, *Fort Bragg, North Carolina, Soldier's Environmental Handbook*, (Corps of Engineers, Fort Bragg North Carolina, 1998, 1.

<sup>6</sup> Record of Conversation, personal interview with Dan Frisch, wildlife biologist, Fort Bragg North Carolina, 31Dec 98.

<sup>7</sup> Ibid.

<sup>8</sup> Ibid.

<sup>9</sup> Per Army Chief of Staff directive published November 1996, OPTEMPO is tracked in all posts using man-days away from the bunk by unit per annum. Fort Bragg has an aggregate OPTEMPO of 105 per year; Fort Benning has an aggregate of less than 30, according to OPTEMPO comparison of training briefs conducted by the author Sep-Oct 1997 at Schofield Barracks Hawaii.

<sup>10</sup> Directorate of Training, Fort Benning, GA, *Infantry School Program of Instruction*, (automated document, published by DOT, Benning,).

<sup>11</sup> Inspector General 25<sup>th</sup> Infantry division, *Inspector General Activities 25 ID(L) XO's Handbook*, (IG, 25ID(L), 3 Feb 1998) Appendix 9B.

<sup>12</sup> Authors notes, 25<sup>th</sup> ID(L) Commanders and 1SG Courses, XO/S3 Courses, 1997-8, 25 ID(L), Schofield Barracks, Hawaii.

<sup>13</sup> Fort Benning uses a FB form 59, Fort Bragg uses a form 1528 and requires coordination with G3 training; Schofield Barracks requires a memorandum explaining the activity signed by the unit S3.

## Chapter 5

### Trainer Actions to Take

As we have described adequately now in this paper, there are many enemies of the trainer out there: time; policies; readiness pressures; environmental bureaucracies; and environmental regulations. This chapter will discuss the three major things that a trainer can do to lessen the effects of environmental regulations on his training event: educate, plan, and mitigate.

#### Educate

##### Educate Yourself

The modern trainer does not have the luxury of the trainer 5, 10 or 15 years ago. He must be cognizant of the laws and know the ways to get training accomplished while still satisfying the law. Aside from the requisite mandatory training, the trainer who wants to be informed should read the following books:

- HQDA, Army Regulation 350-1, *Army Training*, 1 Sep 81, and the local Division's 350-1 training regulation. (This is the most important.)
- HQDA, Army Regulation 351-1, *Individual Military Education and Training*, 15 Oct 1987 (*Lists schools and who is responsible for them, explains the ATRRS system, etc*)
- HQDA, *US Environmental Strategy into the 21<sup>st</sup> Century*
- Range Regulation of the post you are on
- *Commander's guide to Environmental Management*, March 1998, US Army Corps of Engineers, Ft Leonard Wood, Missouri.
- TC 5-400, *Unit Leaders Handbook for Environmental Stewardship*  
(Please see the bibliography for more detail)

### **Visit the Master Planner, ENRD section, and Range Officer in Person**

Once the trainer has read the following books, he must visit the Range Control and meet the Range Officer and understand what the overall range plan is for the post. Many times this step is the most important, for then one can compliment the post's strategy as well as conducting meaningful training. No civilian wants to work at cross-purposes with the military; usually a lack of coordination and communication between the "competing agencies" causes this.<sup>1</sup>

### **School the Soldiers – Formally and Informally**

By local policy most posts now have a school that company grade officers attend which trains them on how to train within the constraints of an environmentally protected society.<sup>2</sup> Most require too that the attendee be designated on written orders and that the program associated with the individual be documented. In the 25 ID for example, this is called the Environmental Compliance Officer and inspection Program, and is mandated by AR 200-1 and USAG-HI Policy memorandum dtd 22 Jan 98 Sub: Environmental Compliance and Protection program.

At the battalion level, a senior noncommissioned officer should be the battalion's representative in this field. He should be school trained and familiar with all post policies and incidents. He should also be a savvy operator who knows how to train and satisfy the laws.<sup>3</sup>

## **Plan for Changes to the Training Plan**

### **Modularize your training**

The smart S-3 (operations and training officer) knows that his plans may be disrupted, so he plans for it in advance by modularizing his training plan into definable blocks which can be moved as needed. This not only saves time in planning later, but it allows resources to be tailored as well, and gives the environmental planners the maximum time to take your training plan in and see if they can support it.<sup>4</sup>

### **Get Involved with the Master Planner and Advocate Rotating Training Areas**

One evolutionary strategy that has not gained much support is the rotation of land. Much like slash and burn agriculture, to allow a land area to lay fallow is a good alternative on large areas where such an alternative is feasible. Most posts practice this by blocking out completely the land by use of an overprint, and the rotation of this land is strictly a matter between the range master planner and the range officer. This author would advocate as a minimum the inclusion of the Division or Corps level trainer into this rotational land plan since detailed planning far enough out to be meaningful (2 years is what is required from most units).<sup>5</sup> This two year rotational cycle would benefit wildlife and endangered plants alike, allow biologists to conduct studies, satisfy counts for the US Fish and Wildlife Service, and also take into account both active and reserve unit's planning cycles.<sup>6</sup>

### **Courses to take, Army and Local**

Service schools provide environmental awareness training for soldiers as they attend professional development courses. The training will provide general knowledge of the

impact on their decisions and actions, human health issues, environment, and the integration of the environmental ethic.<sup>7</sup>

The Army also offers correspondence courses that are accredited as highly as resident courses. Some subjects include environmental protection, defense hazardous materials and waste handling, and hazardous materials handling (all referenced in DAPAM 351-20) These courses will allow you to train unit personnel without sending them away for temporary duty, saving you time and money.<sup>8</sup>

Units and installations usually offer tailored courses for their specific installation, tying in the state and local regulations and policies so that the graduate of these schools has better on-site knowledge. Pairing the Army course grad with a local school grad is a way to insure success in the unit program, and a sure-fire way for the trainer to keep ahead of the laws and policies as they change.<sup>9</sup>

### **Mitigating by Planning Ahead: Fixing Training Time Deficiencies Caused by Environmental Regulation**

The sad truth that looms for the planner and trainer is that much of his time will be spent in planning meaningful, environmentally safe maneuver, mitigating the effects of training by thinking well in advance about all the things that could go wrong. TC 5-400 provides a checklist to accomplish this “environmental risk assessment.” This is an unalterable fact of training in the modern Army and indeed the world today.<sup>10</sup>

The other aspect of resources and time taken away by environmental mitigation, however, has to deal with the pure environmental infrastructure or regulation related waste. For instance, when your range time is taken away for 14 hours on a given day because the winds are too high and might cause a fire, that day is a loss, and should be

treated as such. The smart NCO and officer will execute hip pocket training, but that does little to defray the time and expense of deploying a unit to a range, especially when a training density is regulated by a higher (battalion, brigade, or division) training officer. For instance, as the division trainer this author had to regulate the number of days units were scheduled on high use ranges, and if a day was a loss, the unit had to be rescheduled. We also tracked any losses of training time and planned mitigating events at the next resourcing conference. This same system could be implemented in any installation, and if the installation does not observe manual scheduling, a special code could be assigned under the Standardized Army training System (SATS) for a training loss day, and the day made up later. This would of course necessitate the modularized training referenced earlier.<sup>11</sup>

### Notes

<sup>1</sup> Headquarters, Department of the Army, *Training Circular (TC) 5-400, Unit Leader's Handbook for Environmental Stewardship*, (Headquarters Washington DC, 3 October 1995), 6-3.

<sup>2</sup> Ibid.,4-11

<sup>3</sup> Ibid.,3-2.

<sup>4</sup> Department of the Army, *FM 25-101, Battle Focused Training*, (Department of the Army, Washington, DC 30 Sep 1990), Chapter 3.

<sup>5</sup> Ibid.

<sup>6</sup> Record of Conversation, personal interview with Dan Frisch, wildlife biologist, Fort Bragg North Carolina, 31Dec 98

<sup>7</sup> <sup>7</sup> Headquarters, Department of the Army, *Training Circular (TC) 5-400, Unit Leader's Handbook for Environmental Stewardship*, (Headquarters Washington DC, 3 October 1995), 4-11.

<sup>8</sup> Ibid.

<sup>9</sup> Ibid.

<sup>10</sup> Ibid.,5-9, 5-11.

<sup>11</sup> United States Army Training Support Center, The Standard Army Training System, (automated program, database, and manuals, Headquarters TRADOC, Fort Monroe, VA,1996), CD1

## Chapter 6

### Future Impacts of Environmentalism on Army Training

*If present trends continue, the world in 2000 will be far less crowded, less polluted, more stable ecologically, and less vulnerable to resource – supply disruption than the world we live in now. Stresses involving population, resources, and environment will be less in the future than now...the world's people will be richer in more ways than they are today...The outlook for food and other necessities of life will be better. Life for most people on earth will be less precarious economically than it is now.*

Natural Resources for the 21<sup>st</sup> Century, 1990, page 316

Whether or not that Epicurean view has come true for the majority of the world is up for discussion, but largely it is true in the United States. The real value of money is up, the gas prices are lower than they have ever been, and the cost of a bag of groceries is less than it has been in the last ten years. In fact, James Bradford DeLong, of the San Francisco Federal Reserve Bank says: "Modern growth is so fast, it's off the scale."<sup>1</sup> The agriculture markets are glutted in hogs and cattle and steady in small grain.<sup>2</sup> All in all the private sector is doing well, and America is prosperous. But the Army as a training institution is doing more training (more quantity, less quality) than in years past, and more operational missions. Our OPTEMPO is high and remains high as the National Security Strategy of Cooperative Engagement keeps units on the go.<sup>3</sup> According to G3 Training, 25<sup>th</sup> Infantry Division (Light) in December of this year, the pace has picked up in the past six months, and at one point next year the division will have 5 of 6 infantry

battalions deployed at one time.<sup>4</sup> This mirrors the state of the rest of the Army's active light units – doing more, deployed more.<sup>5</sup> Coupled with this fact is the truth that the training requirements of units have not been lessened.

### **Relief from the Endangered Species Act will not come for Government**

The main environmental law that restricts training in the United States is the Endangered Species Act. As shown earlier, by listing both animals and plants the trainer faces restrictions on how much, what type, and where he can train on Federal lands throughout the United States.<sup>6</sup>

When President Nixon signed the Endangered Species Act in 1973, there were 109 species listed on the legislation. Today there are 1,177 with no sign of a decrease.<sup>7</sup> In theory, as an animal or plants numbers rise through protection, they are taken off the list. But as of December 1998 only 27 have been removed and of those, 16 have disappeared or listed by mistake.<sup>8</sup>

Environmentalists see the law as visionary. Mark Van Putten, President of the National Wildlife Foundation, says: “It’s been the catalyst for a profound change in how we view and treat the land.”<sup>9</sup> The Army states in its environmental vision statement that “The Army will be a national leader in environmental and natural resource stewardship for present and future generations as an integral part of our mission.”<sup>10</sup>

So the future holds more Environmental laws and more regulation for the Army, not less. In practice, the trainer must learn to accomplish his training and satisfy the laws – and not just at home station. As the Army deploys more, the spectre of International environmental law rears its head. Happily, most of us have been trained to a higher

standard by mandating enforcement of the current US laws – the countries we visit don't have laws nearly as tough.

### **Increased Competition for Training Land**

On the past three posts where I have been stationed, all three were engaged in a land swap deal with the local or state government. (Schofield, Benning, Irwin,) On Fort Bragg where I visited in December 1998, they had just completed an 11,000-acre land swap deal with the state. In all four of these cases, the land swap deals were driven by the following two reasons:

Each post had more units since the drawdown began, needed to maneuver State could trade untilable/remote land for valuable land closer to urban areas.  
*Additionally:*

All new land acquired had some environmental problem (i.e., required money and action to protect, search and classify).<sup>11</sup>

Thus one can see that the land needs will continue to be a problem even as the Army acquires new land, for in three of the four cases (and the fourth results were pending but looking the same) the new parcels of land contained protected species on them and thus severely limited the types of training available.<sup>12</sup>

### **Working within the Law – Incidental Take and Smart Planning by Thinking Ahead**

Then only way that the trainer can accomplish his mission is by thinking ahead and working within the laws. As a professional Army officer employed by the government, one must also abide by all applicable federal laws. The leader must be smart about what the law says and how to quantify his training and readiness. He must know what the protected plants and animals look like, and be cognizant enough to realize when to get the wildlife biologist involved and ask for an environmental assessment, or incidental take if the exercise warrants. The area of incidental take is one which most post environmental

division people are wary to start, for it enables aggressive training in protected areas, and opens the post up for potential legal action. The legal precedent is easily understood, for the incidental take measure was meant as a lever to fight legalism in the first place. In 1982, Congress passed a measure allowing the issuing of permits for incidental take of protected species as a part of land use or specific habitat conservation plan.<sup>13</sup> In other words, if a project is deemed essential, some protected species (plants and animals) may have to die. This concept is called “incidental take” – that is, the taking of animals and plants are incidental to the essential nature of the project. No one that this author spoke with has ever heard this applied to training, and I have only seen this idea advanced once in May 1998 and that was in a far reaching plan for range opening, not near term planning.<sup>14</sup> Nevertheless if the two entities of essential training and essential species are to coexist, trainers must ask for incidental take, citing readiness concerns and lack of training days. This new strategy will allow the essential training pursuant to readiness to fight and win the nation’s wars and operations.

## Notes

<sup>1</sup> James Bradford DeLong, *Federal Reserve Bank of San Francisco’s Economic letter* #98-31, (Research Department, Federal Reserve Bank of San Francisco, San Francisco, California), 1.

<sup>2</sup> Information gleaned by author from Commodities Section, The Fayetteville Observer, North Carolina State Agricultural Markets, (The Fayetteville Observer, Fayetteville, North Carolina, 28-31 Dec 1998)

<sup>3</sup> The White House, *A National Security Strategy for a New Century*, (The White House, Washington, DC, October 1998, 1.

<sup>4</sup> Record of Phone Conversation, conversation between author and Captain Lance Moore, training management officer, 25ID(L), 7 Jan 1999.

<sup>5</sup> Record of Conversation with MAJ James G. Riley, Operations Group, Joint Readiness Training Center, Fort Polk, Louisiana, 29 Dec 98.

<sup>6</sup> Vicki R. Patton-Hulce, *Environment and the Law A Dictionary*, (Santa Barbara, Calif, ABC-CLIO, Inc.), 125.

## Notes

<sup>7</sup> H. Joseph Herbert, Associated Press, *After 25 years, species law still subject of Controversy*, (Madisonville Messenger, Madisonville, Kentucky, 31 December 1998), B11.

<sup>8</sup> Ibid.

<sup>9</sup> Ibid.

<sup>10</sup> Headquarters, Department of the Army, *Training Circular (TC) 5-400, Unit Leader's Handbook for Environmental Stewardship*, (Headquarters Washington DC, 3 October 1995), xi

<sup>11</sup> Record of Conversation, personal interview with Dan Frisch, wildlife biologist, Fort Bragg, North Carolina, 31 Dec 98.

<sup>12</sup> Ibid.

<sup>13</sup> Herbert, Associated Press, *After 25 years*, B11.

<sup>14</sup> Record of conversation, Makua planning committee notes, Schofield Barracks Hawaii, 18 May 98.

## **Chapter 7**

### **Conclusions**

As we move into the next century the trainer faces a more daunting task than he ever has in the past. He must first know the environmental laws that can affect his training, and secondly know well the one(s) which primarily affect his plan. He must be an excellent planner and be able to modularize his operational training plan to fit the available time and resources, and be able to leverage the Range and Environmental Divisions on his installation to work with him to achieve mission accomplishment. The laws, of course will remain until repealed, and we are bound to follow them. Seventy-seven laws directly affect Army operations today and we covered the most important seven in this paper. In 1980, all environmental regulations were contained in 450 pages. In 1990, there were 10,000 pages, and the number has only grown since then.<sup>1</sup>

The mission of the training professional is to execute with balance – that is, to look after the readiness of the unit, and satisfy the requirements of the environmental laws so pervasive in our training lands today. That is the triple challenge of training, readiness, and environmentalism for our Army today and in the future.

### **Notes**

<sup>1</sup>United States Marine Corps, *United States Marine Corps Environmental Awareness Guide*, Internet Document: <http://wwwdenix.osd.mil/denix/public/news/marines/ecp.mcecp.html>, 1.

## ***Bibliography***

A National Security Strategy for a New Century. The White House. (The White House, Washington, DC, October 1998.

DeLong, James Bradford. Federal Reserve Bank of San Francisco's Economic Letter #98-31. Research Department, Federal Reserve Bank of San Francisco, San Francisco, California. October 1998.

Endangered Species Branch. Soldier Field Card, Fort Bragg North Carolina. Department of the Army, XVIII Abn Corps and Fort Bragg, Fort Bragg, North Carolina. 4 January 1999.

Endangered Species Branch. The Red Cockaded Woodpecker at Fort Bragg, North Carolina. Department of the Army, XVIII Abn Corps and Fort Bragg, Fort Bragg, North Carolina. 1998.

Environmental Trends. Council on Environmental Quality, Executive Office of the President. US Government Printing Office, Washington, DC. 1989.

Federal Environmental Laws. Office of Environmental Policy and Assistance. Internet source: <http://ltis-ut.en.doe.gov/oepa/laws.html>. 25 Jan 1996.

Field Manual 100-5, Operations. Department of the Army. Headquarters, Department of the Army, Washington, DC. 14 June 1993.

Fort Bragg, North Carolina, Soldier's Environmental Handbook. U.S. Army Corps of Engineers, Construction Engineering Research Laboratories. Corps of Engineers, Fort Bragg North Carolina. 1998.

Herbert, H. Joseph. After 25 years, species law still subject of Controversy. Associated Press. Madisonville Messenger, Madisonville, Kentucky. 31 December 1998.

Infantry School Program of Instruction. Directorate of Training, Fort Benning, Ga. - , automated document, published by DOT, Fort Benning, Georgia.

Inspector General, 25th Infantry Division (Light). Inspector General Activities 25 ID(L) XO's Handbook. IG, 25ID(L), 3 Feb 1998.

Patton-Hulce, Vicki R. Environment and the Law A Dictionary. Santa Barbara, Calif., ABC-CLIO, Inc.

Portney, Paul R. Current Issues in Natural Resource Policy. Baltimore MD: Johns Hopkins University Press, 1982.

The Standard Army Training System. Automated program, database, and manuals. United States Army Training Support Center, Headquarters TRADOC, Fort Monroe, VA, 1996.

Training Circular (TC) 5-400, Unit Leader's Handbook for Environmental Stewardship. Headquarters, Department of the Army. Washington DC, 3 October 1995.

82d Airborne Division Regulation 350-1, Training. Department of the Army, Headquarters 82d Airborne Division, Fort Bragg, North Carolina. 82d Abn Div G3 Training, November 1995.

**DISTRIBUTION A:**

Approved for public release; distribution is unlimited.

Air Command and Staff College  
Maxwell AFB, AL 36112